binding complementary DNA to which the modulator **292** is bound to the DNA by hybridization and the like.

[0237] The method for binding the labeling substance **293** to the modulator **292** is performed by the same method as the method for binding the modulator **292** to the binding substance **291**.

[0238] Subsequently, the detection process is performed [see the detection process of FIG. **23**D].

[0239] In the detection process, the user first injects an electrolytic solution through the sample inlet **30***b* of the detection chip **20**. Thereafter, the user inserts the detection chip **20** into the chip insertion unit **11** of the detector **1** shown in FIG. **1**. Then, the user gives an instruction to start measuring to the detector **1**. Here, the electrode leads **71**, **72**, and **73** of the detection chip **20** inserted into the detector **1** are connected to the ammeter **14** and the power source **15**. Then, an arbitrary potential based on the reference electrode **69** is applied to the working electrode body **61** by the power source **15** of the detector **1**. As the potential to be applied to the electrode, a potential in which the current value (stationary current, dark current) is low when the analyte is not irradiated with excitation light and the photocurrent generated from the analyte becomes a maximum photocurrent is preferred. The potential may be applied to the counter electrode **66** or the working electrode body **61**.

[0240] Thereafter, the light source **13** of the detector **1** emits excitation light to the labeling substance **293** on the working electrode **60**. Thus, the labeling substance **293** is excited to generate electrons. The generated electrons move to the working electrode **60**. As a result, current flows between the working electrode **60** and the counter electrode **66**. Then, the current flowing between the working electrode **60** and the counter electrode **66** is measured by the ammeter **14** of the detector **1**. The current value measured by the ammeter **14** correlates with the number of the labeling substance **293**. Therefore, the analyte S can be quantified based on the measured current value. The excitation light may be only light in a specified wavelength region, which is obtained using a spectrometer or a bandpass filter, if necessary.

[0241] Thereafter, a current value digitally converted by the A/D converting unit **16** is input into the control unit **17**. Then, the control unit **17** estimates the amount of the analyte in the sample from the digitally converted current value based on a calibration curve indicating a relationship between a current value created in advance and the amount of the analyte. The control unit **17** creates a detection result screen for displaying the information on the estimated amount of the analyte on the display **12**. Thereafter, the detection result screen created by the control unit **17** is sent to the display **12** so as to be displayed on the display **12**.

[0242] As the electrolytic solution, a solution containing an electrolyte composed of salts which may supply electrons to the labeling substance **293** in an oxidized state, an aprotic solvent or a protonic polar solvent can be used. The electrolytic solution may further contain other components, if desired. The electrolytic solution may be in gel or solid form.

[0243] As the electrolyte, the same electrolyte described in the first embodiment can be used.

[0244] The electrolyte concentration of the electrolytic solution is preferably from 0.001 to 15 M.

[0245] When the labeling substance **293** is irradiated with light, a light source which can emit light in a wavelength capable of photoexciting the labeling substance **293** can be used. The light source can be suitably selected depending on the type of the labeling substance **293**. As the light source, the same light source described in the first embodiment can be used.

[0246] In the measurement of a photocurrent derived from the labeling substance **293**, for example, a measurement device which includes an ammeter, a potentiostat, a recorder, and a computer can be used.

[0247] In the detection process, the amount of the analyte can be examined by quantifying the photocurrent.

[0248] As described above, in the method for electrochemically detecting an analyte according to the present embodiment, when detecting the analyte S, the modulator **292** intervenes between the binding substance **291** and the labeling substance **293** [see FIG. **23**D]. On the other hand, in the conventional method for electrochemically detecting an analyte, for example, as shown in FIG. **24**A, a labeled antibody **201** obtained by directly labeling an antibody **202** as a binding substance with a labeling substance **203** is used in labeling of the analyte S. A complex containing the trapping substance **281** on the working electrode body **61**, the analyte S, and the labeled antibody **201** is formed, and the analyte S is detected based on the current (photocurrent) generated from the labeling substance **203** in the complex formed on the electrode. Thus, in the conventional method shown in FIG. **24**, the specific volume of the complex formed in detecting the analyte S becomes a large restriction in achieving high sensitivity. Thus, the photocurrent being detected tends to be small.

[0249] However, in the method for electrochemically detecting an analyte according to the second embodiment of the present invention, the specific volume of the complex to be formed on the working electrode **60** is larger than that of the complex formed when labeling the analyte S by the conventional method shown in FIG. **24**. Despite that, the analyte can be unexpectedly detected with high detection sensitivity as compared with the conventional method shown in FIG. **24**.

[0250] In the method for electrochemically detecting an analyte according to the present embodiment, from the viewpoint of suppressing the generation of noises due to contaminants, the user may discharge a remaining liquid containing contaminants from the sample inlet **30***b* of the detection chip **20** after the process of trapping an analyte and wash an inside of the detection chip **20**. In the washing of the inside of the detection chip **20**, organic solvents such as a buffer (particularly a buffer containing a surfactant); purified water (particularly purified water containing a surfactant); and ethanol can be used.

[0251] In the method for electrochemically detecting an analyte according to the present embodiment, from the viewpoint of removing free label binding substance **290** which is not bound to the analyte S and improving the detection accuracy, the process of washing the inside of the detection chip **20** to remove the free label binding substance **290** may be further performed after the labeling process. For example, ethanol and purified water can be used for the washing.

[0252] In the present invention, the operation may be performed so as to form a label binding substance in the labeling process as shown in FIG. **25** in place of labeling the analyte S using the label binding substance to which the labeling substance is bound in advance in the labeling process. In the method for electrochemically detecting an analyte shown in FIG. **25**, the process of supplying a sample (FIG. **25**A), the process of trapping an analyte (FIG. **25**B), and the detection process (FIG. **25**D) are the same as the process of supplying a sample (FIG. **23**A), the process of trapping an analyte (FIG.